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Ref: EPR-N

April 17, 2008

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Colorado State Office
2850 Youngfield Street
Lakewood, CO 80215

Subject: Draft Oil Shale and Tar Sands Resource Management Plan (RMP) Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming:
Draft Programmatic Environmental Impact Statement (draft PEIS) [CEQ# 20070524]

Dear Ms. Thompson:

The U.S. Environmental Protection Agency (EPA) has reviewed the Bureau of Land Management's (BLM) Draft Programmatic Environmental Impact Statement (draft PEIS) for Oil Shale and Tar Sands Resource Management Plan (RMP) Amendments to address the land use allocations for a commercial leasing program. Our review and comments are provided pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(c) and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609.

The draft PEIS considers alternatives for making BLM-administered lands available for application for future commercial leasing of both oil shale and tar sands resources. The study area for the oil shale resources includes portions of the Green River Formation located in the Piceance, Uinta, Green River, and Washakie Basins. The draft PEIS would amend twelve Resource Management Plans to describe those mineral resource areas where oil shale and tar sands deposits are present, and to designate which portions of those areas are appropriate for application for commercial leasing, exploration, and development. The Preferred Alternative would make approximately 2 million acres of lands containing oil shale resources available for application for commercial leasing and approximately 430,000 acres available for tar sands.

The draft PEIS states that BLM will conduct additional NEPA analyses prior to any leasing of these lands for oil shale or tar sand development. The NEPA analyses conducted prior to leasing will enable BLM to evaluate the potential environmental impacts of a project-specific extraction technology. In addition to the direct project impacts, the subsequent NEPA analyses will also consider cumulative impacts and the indirect environmental impacts from the proposed project, including impacts from new coal-fired or nuclear power plants that may be built to support the additional energy demands of oil

shale and tar sands extraction. Given the sensitive resources and the potential for impacts to air quality and water quality, EPA believes that it may be difficult to support a FONSI in the subsequent NEPA analyses.

EPA recognizes the complexity of the proposed land use allocation to support a commercial leasing program for the development of oil shale and tar sand resources. We support an energy policy that assures a long-term, sustainable balance between available energy supplies, energy demand, and protection of ecosystems and human health.

EPA has several primary concerns which are summarized in our cover letter: (1) impacts to surface water and groundwater; (2) air quality; (3) depth of the alternatives analysis; and (4) the adequacy of the cumulative impacts analysis. The enclosed "Detailed Comments" provide more discussion of our concerns regarding these and other issues in the draft PEIS.

Surface Water and Groundwater Resources

EPA believes that the Final Programmatic Environmental Impact Statement (final PEIS) should fully consider whether there is sufficient surface water to support industrial development and other reasonably foreseeable projects in the region of influence. We believe the final PEIS should address measures that can prevent the surface water resources in the Upper Colorado River Basin from becoming overextended. Factors that could influence this outcome include additional growth, continued drought, the utilization of existing or pending water rights in the Basin, as well as climate change.

EPA also is concerned about the fate and transport of salts, selenium, arsenic, and polynuclear aromatic hydrocarbons in groundwater. There are cases where these contaminants may be converted to more mobile chemical species in the formation when oil shale is recovered. The final PEIS should review and analyze the potential impacts of the various oil shale recovery methods.

Air Quality

EPA believes that the oil shale and tar sands development processes may have significant, adverse impacts to air quality, in particular by increasing levels of ozone and nitrogen deposition and by impairing visibility on a regional level. We believe detailed air quality analyses have a place in subsequent NEPA analyses for all national ambient air quality standards (NAAQS), visibility, and air quality-related values (AQRV) in the region. EPA recommends a more thorough analysis of cumulative impacts on air resources in subsequent NEPA documents. This will be critical to protect public health and the large number of Class I areas in proximity to these lands.

The Clean Air Act (CAA) requires special protection of air-quality related values in Class I areas, several of which are situated near the proposed oil shale and tar sand resource areas. There are also sensitive Class II areas nearby. Given the need for protecting these ambient air quality areas from deterioration, EPA recommends that these Class I and II areas receive additional consideration in the final PEIS analysis and subsequent NEPA analyses.

Alternatives Analysis

The alternatives analysis in the draft PEIS does not include a thorough discussion of why several alternatives were not carried through full analysis. In addition, the draft PEIS does not analyze the no action alternative to the same extent as the action alternatives. To address these issues, EPA recommends that the final PEIS analyze a broader range of alternatives, provide additional justification for the alternatives that were eliminated from detailed analysis, and provide further analysis of the no action alternative.

Cumulative Impacts

EPA believes that the final PEIS, and subsequent NEPA analyses for the leasing decisions, should address with greater specificity the cumulative effects on the environment. It is important to examine carefully cumulative impacts before leasing decisions are made, as it may be difficult to determine the cumulative impacts of the individual leases when they are reviewed separately.

The draft PEIS should address the cumulative impacts with a greater degree of specificity including an analysis of reasonably foreseeable development scenarios. EPA acknowledges that the ability of BLM to assess the reasonably foreseeable development scenarios is somewhat limited without having specific plans for commercial scale development. However, given that Congressional intent was to establish a commercial leasing program that would result in an oil shale industry capable of significantly reducing dependence on foreign oil imports, a substantial amount of development seems likely and should be discussed in the final PEIS. We suggest the cumulative impact analysis assess a range of reasonably foreseeable development scenarios (e.g., 200,000 barrels produced per day (bpd), 1 million bpd, and 3 million bpd).

EPA recommends that the interagency council of cooperating and participating agencies continue to meet to discuss the impacts to surface water resources, and the appropriate depth of EIS analysis and mitigation measures for the subsequent leasing decisions. We believe that the final PEIS can state more clearly that subsequent levels of NEPA analysis are needed to implement the leasing decisions. EPA recommends that the final PEIS specify that this analysis will examine the environmental impacts that have been indicated in the draft PEIS.

Consistent with section 309 of the Clean Air Act, it is EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project. In accordance with our policies and procedures for reviews under NEPA and Section 309 of the Clean Air Act, EPA is rating this draft PEIS as "Environmental Concerns – Insufficient Information" (EC-2), for reasons given in this letter and the enclosed detailed comments. The "EC" rating is given because our review has identified environmental impacts that should be avoided in order to fully protect the environment. The "2" rating represents that the draft PEIS does not contain sufficient information to fully assess environmental impacts that may be avoided in order to fully protect the environment. This is in accordance with EPA's national rating system, a description of which is enclosed.

We appreciate the opportunity to review this draft PEIS and are available to discuss our comments. Please send one hard copy of the final PEIS and one CD ROM copy to this office at the same time it is officially filed with our Washington, D.C. Office. If you have any questions, please contact me at (303) 312-6004 or James Hanley, the lead reviewer for this project, at (303) 312-6725 or at hanley.james@epa.gov.

Sincerely,

/s/ Larry Svoboda
Director, NEPA Program

Enclosures: Summary of EPA Rating Definitions
Detailed Comments

cc: Heads of Cooperating Agencies:

**US EPA DETAILED COMMENTS
OIL SHALE AND TAR SANDS RESOURCE MANAGEMENT PLAN (RMP) AMENDMENTS
TO ADDRESS LAND USE ALLOCATIONS IN COLORADO, UTAH, AND WYOMING:
DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT (DRAFT PEIS)**

Surface and Groundwater Resources

EPA is concerned about the potential adverse impacts to water resources that would result from commercial-scale leasing. The draft PEIS describes uncertainty regarding whether sufficient amounts of surface and groundwater will be available for projects within the region of influence. We believe the final PEIS can clearly address what measures can be taken, and by whom, should the surface water resources in the Upper Colorado River Basin become overextended due to additional growth, continued drought, and the utilization of existing or pending water rights in the Basin.

The potential for future climate change to impact the availability of surface water and groundwater is not discussed in the document. EPA recommends that the cumulative impact analysis for surface water and groundwater be amended to include a discussion of the potential effects of future climate change on the proposed commercial leasing and projected subsequent development, including the connected action of water infrastructure development. We recommend this discussion provide a short summary of the climate change studies specific to the project area and the Upper Colorado River Basin¹, including their findings on potential environmental and water supply effects and their recommendations for managing these effects.

We recommend that the final PEIS clarify the regulatory structure for protecting groundwater, by describing the role of the Colorado, Utah, and Wyoming State Engineers in protecting beneficial uses, human health, and the environment. This would include, for example, describing the water right permits and whether they include special conditions, discussing measures to mitigate direct, indirect, and cumulative impacts, and establishing provisions for monitoring and adaptive management.

EPA also is concerned about the fate and transport in groundwater of salts, selenium, arsenic and polynuclear aromatic hydrocarbons that may be converted to more mobile chemical species in the formation when oil shale is recovered. We believe BLM can address this risk to groundwater quality from any of the potential oil shale recovery methods in the final PEIS and subsequent NEPA analyses.

Section 5.5 of the draft PEIS states that no mitigation would be required for groundwater resources, in spite of the draft PEIS' conclusion that groundwater withdrawals could lead to significant cumulative decline in groundwater levels and flows (Section 5.5.1.2; pg. 5-27). EPA recommends that BLM revisit groundwater mitigation in the final PEIS in light of the potentially significant direct and cumulative impacts to groundwater resources.

EPA also recommends that BLM clearly describe the groundwater monitoring program in the final PEIS, and define the responsibility for monitoring in the commercial leasing program for oil shale and tar sand leasing.

¹ A number of studies specific to the Colorado River Basin indicate the potential for significant environmental impacts as a result of changing temperatures and precipitation (Colorado River Basin Water Management: Evaluating and Adjusting to Hydroclimatic Variability, National Research Council, 2007).

Given the potential for adverse impacts from pumping groundwater, EPA believes it is important that detailed monitoring and mitigation information from the proposed project be provided to the public and decision-makers.

Recommendations:

EPA recommends that:

- the final PEIS address measures to be taken if groundwater resources become overextended;
- the cumulative impact analysis for surface water and groundwater evaluate the potential effects of future climate change on the proposed project and water infrastructure development;
- the climate change discussion summarize and incorporate findings from the above-mentioned studies;
- the final PEIS describe the role of the Colorado, Utah, and Wyoming State Engineers in protecting groundwater beneficial uses, human health, and the environment;
- the final PEIS clarify that subsequent NEPA analyses will address the risks to groundwater quality from any of the potential oil shale recovery methods;
- BLM revisit groundwater mitigation; and
- the final PEIS clearly describe a groundwater monitoring program and responsibility for implementing the program.

Air Quality Impacts

Chapter 6 provides well-written but only cursory information regarding the qualitative magnitude of air quality impacts from site-specific projects during implementation of a commercial leasing program. BLM did not conduct any air dispersion modeling nor was any air impact analysis conducted. The draft PEIS states “It is not possible to predict site-specific air quality impacts until actual oil shale projects are proposed and designed. Once such a proposal is presented, impacts on these resources would be further considered in project-specific NEPA evaluations and through consultations with the BLM prior to actual development.” (draft PEIS page 4-46) EPA is concerned that a project-specific analysis approach on actual oil shale projects may not capture the true regional scale cumulative effects. EPA believes that the oil shale and tar sands development resulting from the proposed commercial leasing may have significant air emissions that may negatively impact air quality, especially by increasing levels of ozone and nitrogen deposition and impairing visibility on a regional level. Ozone may be of particular concern because of the potential emissions of volatile organic compounds and nitrogen oxides from these and other sources in the resource area.

The CAA requires special protection of air-quality related values in Class I areas, several of which are situated near the proposed oil shale and tar sand resource areas. These areas include Arches National Park, Canyonlands National Park, Black Canyon of the Gunnison National Monument, Flat Tops Wilderness Area, and Mount Zirkel Wilderness Area. There are also sensitive Class II areas nearby, including Colorado National Monument and Dinosaur National Monument. EPA recommends that these Class I and II areas receive additional consideration in the final PEIS analysis and subsequent NEPA analyses.

BLM has initiated an oil shale research, development, and demonstration (RD&D) program on six small tracts to demonstrate the technical and economic feasibility of oil shale extractive technologies. Air pollution emission estimates were not provided for some of these pilot sites. EPA recommends that the final PEIS include a comparative table of air monitoring data from the existing six RD&D leases including emissions values for lead, mercury, and carbon dioxide, as the information becomes available. For subsequent NEPA analyses, EPA recommends that BLM complete a cumulative impact analysis with an emphasis on ozone, visibility, and nitrogen deposition.

EPA recommends that the final PEIS address the range of emission control technologies for use at oil shale production and upgrading facilities to obtain a level of pollutant emission control sufficient to protect air quality standards and levels of concerns, and discuss the factors and processes that were used to select the appropriate technology.

Table 3.5.3-2, Background Concentration Levels Representative of the Study Area, presents ambient monitoring data for the region surrounding the proposed project. Much of the data presented was measured prior to 2005. We suggest that you update Table 3.5.3-2 to include data measured during 2006-2007. Data from Canyonlands National Park Ozone monitoring station and the Garfield, Colorado PM10 monitoring study should also be included. We believe BLM could summarize Visibility data measured at the Arches and Storm Peak IMPROVE sites in the final PEIS.

The draft PEIS does not contain an existing source emission inventory for the planning areas. EPA suggests that each Resource Management Plan (RMP) amendment include an estimate of these air emission sources in relation to the proposed commercial leasing and projected subsequent development. The pollutant estimate should include criteria pollutants, VOC and aldehyde emissions.

Recommendations:

EPA recommends that:

- the final PEIS clarify that subsequent NEPA analyses give additional consideration to Class I areas when proposed project specific evaluations are conducted;
- the final PEIS include a comparative table of emissions values for the existing six RD&D leases, as the information becomes available;
- the final PEIS clarify that for subsequent NEPA analyses, a cumulative analysis for the leasing area be completed with an emphasis on ozone, visibility and nitrogen deposition;
- the final PEIS address the range of emission control technologies that would be evaluated to obtain a level of pollutant emission control sufficient to protect air quality standards and levels of concerns;
- Table 3.5.3-2 be updated to include additional information outlined above; and
- each RMP amendment includes an estimate of these air emission sources in relation to the proposed commercial leasing and projected subsequent development. The pollutant estimate should include criteria pollutants, VOC and aldehyde emissions.

Alternatives Analysis

The draft PEIS examines in detail only a limited range of alternatives. The draft PEIS does not include a thorough discussion as to why alternatives were eliminated from detailed consideration. Based on our review of the draft PEIS, we believe that there are other alternatives, including alternatives not within the jurisdiction of the lead agency, that may indeed be reasonable and practicable alternatives and that merit a full exploration and evaluation in the final PEIS. Such alternatives include some of those that BLM initially considered after scoping but eliminated from serious analysis. EPA recommends that BLM explore oil shale and tar sands extraction and upgrading technology that incorporates carbon capture and sequestration, as well as impact assessment methodologies that establish carrying-capacity thresholds for the resource management plans affected by this draft PEIS .

Although the Alternatives Analysis includes a No Action Alternative, the draft PEIS did not evaluate the No Action Alternative to the same degree and depth of analysis as the other alternatives. EPA believes that this alternative serves as a benchmark that enables decision makers to compare the magnitude of environmental effects of the action alternatives. We believe the No Action Alternative can also be analyzed in depth as it is possible that BLM could select it as the preferred alternative in some situations.

EPA also recommends that for subsequent NEPA analyses, the screening process for determining which alternatives merit detailed consideration should include something similar to the approach used in Canada to report on the current environmental impacts from the oil sands industry there. We suggest that BLM establish technology-screening criteria that utilize an environmental value-weighted evaluation of technologies that demonstrate achievement of environmental protection objectives or mitigation of unavoidable impacts. These criteria would include: 1) demonstration of an independently-accredited environmental management system such as ISO 14001; (2) setting of voluntary targets to limit absolute greenhouse gas emissions; (3) support for water intensity reduction targets; and (4) the ability to meet minimum land reclamation thresholds before additional disturbance occurs.

Recommendations:

- EPA recommends that the Alternatives Analysis be broadened in the final PEIS;
- EPA recommends strengthening the analysis of the No Action Alternative in the final PEIS; and
- the final PEIS clarify that subsequent NEPA analyses consider screening criteria similar to those cited above from the oil sands industry in Canada.

Cumulative Impacts

EPA believes that the final PEIS, and subsequent NEPA analyses for the leasing decisions, should address with greater specificity the cumulative effects on the environment. It is important to examine carefully cumulative impacts before leasing decisions are made as it is difficult to determine the cumulative impacts of the individual leases when reviewed separately.

The draft PEIS should address the cumulative impacts with a greater degree of specificity including an analysis of reasonably foreseeable development scenarios. EPA acknowledges that the ability of BLM to assess the reasonably foreseeable development scenarios is somewhat limited without having specific plans for commercial scale development. However, given that Congressional intent was to establish a commercial leasing program that would result in an oil shale industry capable of significantly reducing dependence on foreign oil imports, a substantial amount of development seems likely and should be discussed in the PEIS. We suggest that BLM prepare a few reasonably foreseeable development scenarios to take into account a potentially significant industry that within the next two decades could produce substantial amounts of oil. Specifically, we suggest that the cumulative impact analysis in the final PEIS assess a range of reasonably foreseeable development scenarios (e.g., 200,000 barrels production per day (bpd), 1 million bpd, and 3 million bpd).

Recommendations:

- EPA recommends that the final PEIS, and subsequent NEPA analyses for the leasing decisions, address with greater specificity the cumulative effects on the environment; and
- EPA recommends that the final PEIS assess a range of reasonably foreseeable development scenarios for production.

Waters of the U.S./Wetlands

The draft PEIS does not address important statutory requirements and executive orders that relate to water resources.

Clean Water Act Section 404

The draft PEIS does not provide sufficient information on the possible discharge of dredged or fill materials into waters of the United States because of this development and the resulting permitting requirements. The Clean Water Act (CWA) prohibits discharges of dredged or fill material into waters of the United States except when authorized by a CWA Section 404 permit. 33 U.S.C. § 1311, 1344. The United States Army Corps of Engineers (Corps) is generally responsible for implementing the CWA Section 404 permitting program. In implementing CWA Section 404, the Corps issues a determination of whether waters in the project area are waters of the United States and thereby subject to the CWA. Specific oil shale projects may be subject to CWA Section 404 and may be required to obtain a CWA Section 404 permit.

Recommendation:

- EPA recommends that the final PEIS explicitly state that any discharges of dredged or fill materials associated with individual leases may require a CWA 404 permit, which would include an additional full alternatives and impacts analysis; and
- EPA also recommends that the final PEIS contain information identifying the types of dredge and fill activities that will be associated with commercial-scale leasing, e.g., road crossings, transmission lines, pipelines and their potential impacts to waters of the U.S.

Executive Order 11990 – Protection of Wetlands

EPA considers the protection, improvement, and restoration of wetlands and riparian areas to be a high priority. The Wetlands Protection Executive Order 11990 (EO 11990) directs federal agencies in certain circumstances to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Executive Order 11990 is not limited to wetlands regulated under the Clean Water Act. EPA believes the final PEIS could discuss how EO 11990 applies to the proposed commercial-scale leasing and how BLM will address this EO.

Energy Generation Requirements

The draft PEIS estimates that 2400 MW of additional energy capacity would be required for oil shale development in the region. This large increase in power demand may require significant new electrical generation and transmission facilities to be constructed. Coal-fired power plants may supply a large portion of this electrical energy. The draft PEIS contains a summary analysis of some of the potential impacts from that development, but missing from that analysis are the impacts of mercury emissions from coal-fired electric generation. EPA recommends that the final PEIS include a more in-depth discussion of the oil shale industry's reliance on new fossil-fuel electricity generation and potential impacts from the new energy requirements, particularly mercury emissions and impacts. In addition, we recommend the final PEIS describe more fully how additional emission controls could reduce the various phases of mercury emissions.

Greenhouse Gas Emissions

EPA believes that BLM should expand the discussion of greenhouse gases and climate change sections in the final PEIS. Although there are currently no EPA regulatory standards directly limiting greenhouse gas emissions, there is enough information developed by the IPCC to inform a more detailed quantitative estimate of the GHG generated by known oil shale and tar sands extraction technologies.²

Section 3.5.1.2, *Global Climate Change*, presents a brief discussion on the potential climate change impacts associated with the potential future commercial development of the oil shale and tar sand resources. This section, however, only includes limited information on the potential impact on greenhouse gas emissions and does not address the carbon dioxide emissions associated with each alternative. EPA recommends that BLM expand its discussion of potential impacts on greenhouse gas

² Since the issuance of the April 2, 2007 Supreme Court opinion in *Massachusetts, et al. v. EPA*, 127 S.Ct. 1438 (2007), EPA has been developing a response to the remand as well as evaluating the broader ramifications of the decision throughout the Clean Air Act (CAA). On March 27, 2008, the Administrator announced that he has directed his staff to draft an Advanced Notice of Proposed Rulemaking (ANPR) to discuss and solicit public input on the specific effects of climate change and the interrelated issues raised by the possible regulation of greenhouse gas emissions under the CAA. Thus, this comment letter does not reflect, and should not be construed as reflecting, the type of judgment that might form the basis for a positive or negative finding under any provision of the CAA.

emissions and include an assessment of the greenhouse gas emissions associated with each alternative.

Although the draft PEIS includes a brief discussion on *Air Quality Cumulative Impacts* in Section 6.1.5.3.5, the cumulative impacts analysis does not evaluate greenhouse gas emissions, nor does the cumulative impact analysis address the impact that greenhouse gas emissions may have on climate change³. EPA recommends that the cumulative impacts analysis include discussion of potential oil shale tar sands development's level of contribution to greenhouse gases on a regional, national, and global scale.

Comparing the magnitude of annual emissions from projected oil shale development to annual emissions from other sources in the area will enable the decision-makers to better understand the extent to which their decisions on the proposed resource allocation may affect regional greenhouse gas emissions. In February 2007, New Mexico and Arizona joined with California, Oregon, and Washington to create the Western Regional Climate Action Initiative, a joint strategy to fight global warming. This initiative includes development of a design for a regional market-based multi-sector mechanism, such as a load-based cap and trade program, to achieve regional greenhouse gas reduction goals. Colorado, Utah, and Wyoming are official observers to this Western Regional Climate Action Initiative. Therefore, EPA believes that it would be useful for decision-makers in Colorado, Utah, and Wyoming if the final PEIS addresses the greenhouse gas contribution of the proposed commercial leasing and projected subsequent development within the context of other contributors at the state and regional level.

In addition to providing regional context, we recommend that the final PEIS compare the annual greenhouse gas emissions from the proposed oil shale industry to estimated annual greenhouse gas emissions from all sources combined at a national and global scale. The U.S. Department of Energy has quantified emissions of greenhouse gases in the United States⁴ and EPA⁵ has released similar data in a 2007 report. The Carbon Dioxide Information Analysis Center (CDIAC) has assimilated additional information on carbon emissions from the burning of fossil fuel and other sources at a regional, national, and global scale⁶.

The draft PEIS also does not fully address opportunities to mitigate or reduce greenhouse gas emissions. There are a number of voluntary measures available to reduce and offset greenhouse gas emissions and EPA recommends that the final PEIS address them. These include improving plant efficiency, carbon capture and sequestration, and the purchase of offsets.

Recommendations:

³ We note here the recent decision of the United States Court of Appeals for the Ninth Circuit, *Center for Biological Diversity v. National Highway Traffic Safety Administration*, No. 06-71891 (9th Cir. November 15, 2007).

⁴ For example, see the *Emissions of Greenhouse Gases in the United States 2006*, DOE/EIA-0573(2006), November 2007, available at: <ftp://ftp.eia.doe.gov/pub/oiaf/1605/cdrom/pdf/ggrpt/057306.pdf>.

⁵ For example, see the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2005*, April 17, 2007, available at: <http://www.epa.gov/climatechange/emissions/downloads06/07CR.pdf>.

⁶ The CDIAC is the primary climate change data and information analysis center of the [U.S. Department of Energy](http://www.energy.gov). Information can be found at <http://cdiac.ornl.gov/ndps/ndp030.html>.

EPA recommends that:

- the final PEIS quantify and disclose the amount of carbon dioxide emissions associated with all alternatives to the extent possible.
- the final PEIS evaluate the emissions performance level for all alternatives, in terms of pounds of carbon dioxide per barrel of shale oil-equivalent.
- the final PEIS consider utilizing a greenhouse gas equivalencies calculator⁷ to translate greenhouse gas emissions into terms that are easier to contemplate (For example, EPA estimates annual emissions from the required coal-fired generation capacity would be 7.08 million tons of carbon dioxide, which is equivalent to 1,390,000 passenger cars driven for one year.);
- the final PEIS discuss: 1) carbon capture and sequestration and other voluntary means of capture and storage of carbon dioxide; 2) the costs associated with implementing these measures; 3) design modifications necessary to allow physical space for future carbon dioxide capture; and 4) the feasibility of implementing these measures; and shale oil upgrading efficiency to reduce carbon dioxide emissions, as well as what opportunities may exist to purchase carbon dioxide offsets
- the final PEIS present a general, qualitative discussion of the anticipated effects of climate change, including potential effects at a regional scale;
- the final PEIS compare anticipated annual greenhouse gas emissions from the proposed commercial leasing and projected subsequent development to annual emissions from other existing and reasonably foreseeable future projects, including the other greenhouse gas emitting projects in the States of Colorado, Utah, and Wyoming;
- the final PEIS compare anticipated annual greenhouse gas emissions from the proposed commercial leasing and projected subsequent development to annual emissions from all sources combined at a national and global scale using data collected by the U.S. Department of Energy and EPA; and
- the final PEIS identify the EPA voluntary greenhouse gas reduction programs that would apply (e.g., a shale oil upgrade facility might consider EPA's Gas STAR program, <http://www.epa.gov/gasstar/index.htm>).

Construction Emissions Mitigation

The draft PEIS does not contain information regarding opportunities to reduce air emissions associated with construction. EPA recommends an evaluation of the following measures to reduce construction emissions of criteria air pollutants and hazardous air pollutants (air toxics). EPA recommends that the final PEIS include a *Construction Emissions Mitigation Plan* to reduce construction emissions and commit to the use of these measures during construction, as appropriate.

Recommendations:

EPA recommends that the Construction Emissions Mitigation Plan:

- reduce emissions of diesel particulate matter (DPM) and other air pollutants by using particle traps

⁷ For example, see the U.S. Climate Technology Corporation Gateway website, which is sponsored by the EPA and the U.S. Agency for International Development. See <http://www.usctcgateway.gov/tool/>.

and other technological or operational methods. (Control technologies such as traps control approximately 80 percent of DPM. Specialized catalytic converters (oxidation catalysts) control approximately 20 percent of DPM, 40 percent of carbon monoxide emissions, and 50 percent of hydrocarbon emissions.);

- ensure that diesel-powered construction equipment is properly tuned and maintained, and shut off when not in direct use;
- prohibit engine tampering to increase horsepower;
- locate diesel engines, motors, and equipment as far as possible from residential areas and sensitive receptors (schools, daycare centers, and hospitals);
- require low sulfur diesel fuel (<15 parts per million), if available;
- reduce construction-related trips of workers and equipment, including trucks;
- lease or buy newer, cleaner equipment (1996 or newer model), using a minimum of 75 percent of the equipment's total horsepower;
- use engine types such as electric, liquefied gas, hydrogen fuel cells, and/or alternative diesel formulations; and
- ensure that BLM works with the local air pollution control district(s) to implement the strongest mitigation for reducing construction emissions.

Hazardous Materials Impacts

Coal Combustion Products (CCPs)

As oil shale development will likely require additional electricity generation from coal-fired plants, EPA recommends that the final PEIS address coal combustion products (CCPs), the byproducts generated from burning coal in coal-fired power plants. These byproducts include fly ash, bottom ash, boiler slag, and flue gas desulfurization (FGD) gypsum. EPA promotes the beneficial reuse of CCPs through its Coal Combustion Products Partnership (C2P2), a voluntary program to reuse CCPs in commercial applications to divert waste and save natural resources. Additional information about C2P2 can be found at <http://www.epa.gov/epaoswer/osw/conservation/c2p2/index.htm>. CCP reuse can mitigate potential negative effects of placing CCPs in landfills and/or mines, while simultaneously resulting in economic benefits. EPA encourages participation in C2P2 program. For more information on CCP reuse and partnership opportunities, please contact Kendra Morrison (303-312-6145) in the EPA Region 8 Solid and Hazardous Waste Program.

Subsequent NEPA Analyses Recommendations

As BLM may be unable to address all the potential impacts at this stage before more specific information about leasing decisions is known, EPA recommends that the final PEIS establish a framework to analyze these impacts in subsequent NEPA analyses. To recap, we have made several recommendations above that are specifically related to subsequent NEPA analyses, including that:

- groundwater quality impacts from any of the potential oil shale recovery methods should be presented in subsequent EIS analyses;
- BLM should adopt technology-screening criteria for the screening process for determining which

alternatives merit additional consideration in subsequent NEPA analyses;

- BLM should address cumulative impacts on air, groundwater, surface water and other media with greater specificity. The cumulative analysis for air quality should emphasize ozone, visibility and nitrogen deposition, and Class I areas should be given additional consideration when proposed project specific evaluations are conducted;
- the subsequent NEPA analyses should carefully evaluate the indirect environmental impacts from the proposed project, including impacts from the development of coal-fired or nuclear power plants that may be built to support the additional energy demands of oil shale and tar sands extraction;
- detailed air quality analyses should be presented in subsequent NEPA analyses for all national ambient air quality standards (NAAQS), visibility, and air quality-related values (AQRV) in the region;
- subsequent NEPA analyses for the individual leases should address plans to reduce construction emissions